

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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REQUEST FOR RECONSIDERATION

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April 26, 2010

Sir:

In response to the Office Action mailed December 24, 2009, the period for response having been extended for one (1) month by the attached Petition for Extension of Time, Applicants respectfully submit the following Remarks traversing the rejections in this Office Action mailed December 24, 2009.

Specifically, Applicants respectfully submit that all of the claims presented for consideration by the Examiner patentably distinguish over the teachings of the prior art applied by the Examiner in rejecting claims in the Office Action mailed December 24, 2009, that is, the teachings of the U.S. patents to Takahashi, No. 6,326,074, to Morishima, et al., No. 6,306,947, to Takeuchi, et al., No. 6,558,799, to Tsukada, et al., No. 5,296,340, to Ogawa, et al., No. 5,266,397, to MacQueen, No. 6,841,221, and to Klun, et al., No. 4,855,184, under the provisions of 35 USC 102 and 35 USC 103.

It is respectfully submitted that these references as applied by the Examiner would have neither taught nor would have suggested such a decorative material, or

decorative plate, as in the present claims, including, inter alia, the low-luster pattern ink layer formed on part of the substrate and a surface protective layer which is present on and in direct contact with the pattern ink layer so as to cover a whole surface including both a region where a low-luster pattern ink layer is formed and a region where no pattern ink layer is formed, and with the surface protective layer being provided with a first, low-gloss region located in a portion just above the pattern ink layer and in the vicinity of this portion, the pattern ink layer serving to generate a difference in gloss between the first and second regions, the first region being visually recognized as a concave portion, pattern ink of the pattern ink layer containing a non-crosslinked urethane resin and an unsaturated polyester resin as a binder, and with the pattern ink of the pattern ink layer having a property of interacting with the ionizing radiation-curable resin composition for forming the surface protective layer to cause elution, dispersion and mixing therebetween, the non-crosslinked urethane resin having a number average molecular weight in the range of 10,000 to 50,000 and a glass transition temperature in the range of -70° to -40°C. See claim 1. Note also claim 19.

In addition, it is respectfully submitted that these references would have neither taught nor would have suggested such a decorative material as in the present claims, having the pattern ink layer formed on part of the substrate and a surface protective layer present on and in direct contact with the pattern ink layer so as to cover a whole surface including regions where the pattern ink layer is formed and where no pattern ink layer is formed, the pattern ink layer serving to generate a difference in gloss between the region where the pattern ink layer is formed and the region where no pattern ink layer is formed, the pattern ink which forms the pattern ink layer containing a non-crosslinked urethane resin as a binder and the ionizing

radiation-curable resin composition containing a (meth)acrylate monomer, and wherein the pattern ink has a property of interacting with the ionizing radiation-curable resin composition for forming the surface protective layer to cause elution, dispersion and mixing therebetween, the non-crosslinked urethane resin having a number average molecular weight in the range of 10,000 to 50,000 and a glass transition temperature in the range of -70° to -40°C. See claim 2. Note also claim 28.

As will be discussed in more detail infra, it is respectfully submitted that the present invention differs from the teachings of the applied references, including Takahashi, by the structure by which the concavo-convex appearance is achieved, as well as the mechanism achieving the concavo-convex appearance. That is, in Takahashi, the non-penetrable layer 5 is provided on the penetrable layer 4, and the convex portion is provided on the non-penetrable layer 5, thus realizing the concavo-convex appearance. To be specific, it is necessary in Takahashi that the non-penetrable layer 5 be provided adjacent the top coat 6, to provide a physical convex structure above the non-penetrable layer 5. Takahashi physically provides the concavo-convex appearance due to the use of the non-penetrable layer; and in view thereof, would have taught away from the penetration and mixing between layers as in the present invention.

In contrast, according to the present invention the concavo-convex appearance is provided due to optical illusion, through the combination of the specified low-luster ink layer having a penetrable property by the use of the specified non-crosslinked urethane as in all of the present claims, interacting with the surface protective layer. It is emphasized that according to the present invention the

concavo-convex appearance is due to optical illusion. Note, in particular, the paragraph bridging pages 19 and 20 of Applicants' specification.

Thus, Takahashi and the present invention are entirely different from each other, both in the structure claimed and in the mechanism by which this structure achieves the concavo-convex appearance.

It is respectfully submitted that this different mechanism of concavo-convex appearance of the present invention, achieved due to the different structure thereof (and, in particular, the surface protective layer and the pattern ink layer directly in contact therewith), would not have been disclosed or suggested by the teachings of the applied references, as discussed infra.

In this regard, attention is respectfully directed to the last full paragraph on page 20 of Applicants' specification (correspondingly, paragraph [0071] on page 6 of the published application for the above-identified application). As indicated therein, and in the following paragraph, through use of the urethane resin as in the present claims, that is, a non-crosslinked urethane resin, e.g., having a molecular weight and glass transition temperature as in the present claims, the composition forming the surface protective layer and the low-luster pattern ink can effectively interact to obtain a more remarkable difference in gloss of the pattern, so as to achieve the optical illusion by which the appearance of the decorative material of the present invention is achieved.

To emphasize, Takahashi physically obtains the concavo-convex appearance through non-interaction of the top coat 6 and non-penetrable layer 5. It is respectfully submitted that such disclosure in Takahashi, either alone or in combination with teachings of other references as applied by the Examiner, would have neither disclosed nor would have suggested the combination of surface

protective layer in direct contact with the low-luster pattern ink layer, with the pattern ink layer being formed of a low-luster pattern ink having a property of interacting with the ionizing radiation-curable resin composition to cause elution, dispersion and mixing therebetween, the low-luster pattern ink containing, inter alia, a non-crosslinked urethane resin, with the non-crosslinked urethane resin having a number average molecular weight and a glass transition temperature as in all of the present claims, achieving the optical illusion of the appearance as discussed in the foregoing.

It is noted that the structure of the present invention can include a penetration-preventing layer (note penetration-preventing layer 8 in Fig. 1). According to aspects of the present invention, the surface protective layer at the parts where the convex appearance is not realized is in contact with this penetration-preventing layer 8. However, it is emphasized that according to the present invention, the optical illusion is achieved due to interaction between the surface protective layer 5 and pattern ink layer 3, and such structure and interaction between the surface protective layer 5 and pattern ink layer 3, as in the present claims, would have neither been disclosed nor would have been suggested by the teachings of the applied references.

It is respectfully submitted that the present invention differs from Takahashi even when the present invention includes a penetration-preventing layer 8, as in aspects of the present invention. That is, in the present invention the surface protective layer at the parts where the convex form is not realized is in contact with only the penetration-preventive layer 8, while the top coat layer at the parts where the convex form in Takahashi appears, is in contact with only the penetration layer, as shown in Fig. 1 of Takahashi.

As seen in the foregoing, it is respectfully submitted that the present invention differs from Takahashi as to whether or not the surface protective layer (top coat layer) is in contact with only the penetration-preventive layer (that is, the layer having the non-penetrable property) or only the penetration layer, even when the present invention includes the penetration-preventive layer 8.

The order of lamination of layers of the present invention and in Takahashi is different, even when the present invention includes the penetration-preventive layer. Thus, according to the present invention, the order of lamination from lower to upper is penetration-preventing layer, pattern ink layer and surface coating layer. In contrast, in Takahashi the order of lamination from lower to upper is penetration layer 4, non-penetrable layer 5 and top coat layer 6, which, except for the top coat layer, is directly opposite that of the present invention.

Thus, noting especially claims such as claims 15, 17, 26, 27, 34 and 35, according to various aspects of the present invention a penetration-preventing layer is formed between the substrate and the low-luster pattern ink layer, directly opposite to the structure of Takahashi, wherein the non-penetrable layer 5 is provided between the top coat 6 and penetrable layer 4.

It is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested such decorative material as in the present claims, having features as discussed previously in connection with claims 1 and 2, and, additionally, wherein a penetration-preventing layer is formed between the substrate and the low-luster pattern ink layer (see claims 15 and 26); and/or wherein the penetration-preventing layer is provided between the substrate and the low-luster pattern ink layer, with the penetration-preventing layer having provided thereon the low-luster pattern ink layer and the surface protective layer (see

claims 34 and 35); and/or wherein a colored layer, a pattern layer and a penetration-preventing layer are successively laminated on the substrate, providing laminated layers, with the low-luster pattern ink layer and surface protective layer which is present on and in direct contact with the low-luster pattern ink layer so as to cover a whole surface including both the region where the low-luster pattern ink layer is formed and the region where no low-luster pattern ink layer is formed, are successively formed on the laminated layers (see claims 17 and 27).

Furthermore, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested such decorative material as in the present claims, including further definition of the first, low-gloss region as in claims 30-33, that is, that the first, low-gloss region includes a mixture of a resin component of the low-luster pattern ink and resin of the ionizing radiation-curable resin composition for forming the surface protective layer (note claims 30 and 32); and/or wherein the first, low-gloss region being a region formed by interaction of resin of the uncured radiation-curable resin composition for the surface protective layer and a resin component of the low-luster pattern ink layer to cause partial elution, dispersion and mixing therebetween (see claims 31 and 33).

As will be discussed in more detail infra, it must be emphasized that in Takahashi, the layer 5 is a layer not penetrable by the top coat 6. Clearly, the disclosure of Takahashi would have taught away from the feature of the present invention that the low-luster pattern ink of the low-luster pattern ink layer has a property of interacting with the ionizing radiation-curable resin composition of the top surface layer to cause elution, dispersion and mixing therebetween, as in the present independent claims 1 and 2; or, more specifically, (i) wherein the material has the low-gloss region including a mixture of a resin component of the low-luster pattern

ink and resin of the ionizing radiation-curable resin composition for forming the surface protective layer (note claims 30 and 32), or (ii) wherein such low-gloss region has been formed by interaction of resin of the uncured radiation-curable resin composition for the surface protective layer and a resin component of the low-luster pattern ink layer to cause partial elution, dispersion and mixing therebetween (see claims 31 and 33).

Thus, according to aspects of the present invention, it is important that the low-luster pattern ink of the pattern ink layer 3 has a property of interacting with the ionizing radiation-curable resin composition that forms the surface protective layer 5. By providing such surface protective layer and the low-luster pattern ink layer as in the present claims, in direct contact with each other, the ink of the low-luster pattern ink layer and the surface protective layer are interacted with each other to cause partial elution, dispersion and mixing therebetween. In such a case, respective resin components of the ink contained in the low-luster pattern ink layer and the uncured ionizing radiation-curable resin are not completely compatibilized with each other for a short period of time, but are kept in a suspended state and located in a portion just above the low-luster pattern ink layer and in the vicinity of this portion, so that the suspended portion scatters light to form the low-gloss region. When the surface protective layer is crosslinked and cured while maintaining the suspended state, the suspended state is fixed, so that the low-gloss region is formed in part of the surface protective layer, above the low-luster pattern ink layer, and is recognized as a concave portion due to optical illusion. Note, for example, the paragraph bridging pages 19 and 20 of Applicants' specification.

As will be discussed further infra, in Takahashi, the nonpenetrable layer 5 is formed for preventing the penetration of the ionizing radiation curing resin (see

column 2, lines 54-60 of Takahashi), and is formed by an ink which is impenetrable by an ionizing radiation curing resin constituting the top coat (see column 5, lines 42-50). It is respectfully submitted that such layers described in Takahashi would have neither disclosed nor would have suggested, and in fact would have taught away from, the ionizing radiation-curable resin composition of the surface protective layer, together with the low-luster pattern ink layer formed by the specified pattern ink having the property of interacting with the ionizing radiation-curable resin composition of the surface protective layer, as in the present claims, and effects achieved thereby.

Similarly, in Takeuchi, et al. the first resin layer 2A, the second resin layer 2B and the third layer 2C constituting the two-component cured urethane resin layer 2 are layers comprising the two-component cured urethane resin, and the two-component cured urethane resin comprises the specific polyol component and the isocyanate. Therefore, the third layer 2C in contact with the surface protective layer constitutes the two-component cured urethane resin; and, according to Takeuchi, et al., the third layer 2C has a higher crosslinking density. It is respectfully submitted that the disclosure of Takeuchi, et al. having the third layer 2C with the higher crosslinking density in contact with the surface protective layer, would have neither taught nor would have suggested, and in fact would have taught away from, the presently claimed subject matter, including the low-luster pattern ink having a property of interacting with the ionizing radiation-curable resin composition that forms the surface protective layer to cause elution, dispersion and mixing therebetween, this low-luster pattern ink containing a non-crosslinked urethane resin with molecular weight and glass transition temperature as in the present claims, and advantages achieved thereby.

Furthermore, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested such decorative material as in the present claims, having features as discussed previously in connection with claims 1 and 2, and, moreover, wherein the low-luster pattern ink forming the low-luster pattern ink layer contains non-crosslinked urethane resin and unsaturated polyester resin as a binder (see claim 3; note also claim 1); and/or wherein the ionizing radiation-curable resin composition contains a (meth)acrylate monomer solely (see claim 4); and/or wherein the pattern ink forming the pattern ink layer has a uneven thickness as in claim 5, particularly forming regions of relative gloss as in claim 6; and/or wherein the surface protective layer contains fine particles, an average particle size of the fine particles being that set forth in claims 7 and 21, in particular, that set forth in claims 8 and 9, with the amount of fine particles being that set forth in claim 10; and/or wherein the surface protective layer is formed by crosslinking and curing the ionizing radiation-curable resin composition containing ethylene oxide-modified polymerizable compound, and contains particles of baked kaolin, as in claims 11 and 22; and/or wherein a surface of the surface protective layer above the first region has a convex shape (note claims 14 and 25); and/or wherein the substrate is a penetrable substrate (see claim 16); and/or specific woodgrain pattern of the pattern layer as in claim 18.

Noting particularly present claims 15 and 26, as well as claims 17, 27, 34 and 35, it is again noted that aspects of the present invention include a penetration-preventing layer between the substrate and low-luster pattern ink layer. In contrast, as applied by the Examiner, the nonpenetrable layer is being treated by the Examiner as the low-luster pattern ink layer. The present invention includes the penetration-preventing layer to prevent penetration of material thereover (e.g., of the

pattern ink layer), into layers thereunder. In contrast, in Takahashi the nonpenetrable layer 5 is provided to avoid penetration of material of the top coat into the penetrable layer 4. Thus, in Takahashi the nonpenetrable layer must be between the penetrable layer 4 and top coat 6. It is respectfully submitted that Takahashi, even as applied by the Examiner, would have taught away from features of the present invention including, e.g., the penetration-preventing layer formed between the substrate and the low-luster pattern ink layer, as in various of the present claims.

The invention as presently being considered on the merits in the above-identified application is directed to a decorative material, and to a decorative plate that includes this material, the decorative material being provided with a pattern which has a visual convexo-concave appearance due to a difference in gloss, the material being excellent in durability.

As described on pages 1-6 of Applicants' specification, various surface decorative plates, and decorative sheets thereof, used for furniture or cabinets, having a laminated structure in which a decorative sheet having, for example, a printed woodgrain pattern, is bonded onto a wood material, an inorganic material, a synthetic resin base material, etc., have been proposed. However, previously proposed decorative sheets, for such surface decorative plates, have various problems, including requirements of forming appropriate concave portions for providing portions having a satisfactory feel, requiring complicated processing and having high costs.

Against this background, and as a result of intensive research to provide a decorative material having a proper feel, good appearance and good physical properties, including solvent and abrasion resistance and high laminar strength, the

present inventors have found that the desired material can be formed by providing a specific pattern ink layer, of specified material, selectively on a substrate, with a surface protective layer being provided in direct contact with the pattern ink layer and covering a whole surface of a substrate including both a region where the pattern ink layer is formed and a region where the pattern ink layer is not formed, the pattern ink of the pattern ink layer, which includes a non-crosslinked urethane resin, having a specified molecular weight and glass transition temperature, and having a specific characteristic with respect to the ionizing radiation-curable resin composition used for forming the surface protective layer. That is, the pattern ink has a property that it interacts with the ionizing radiation-curable resin composition for forming the surface protective layer to cause elution, dispersion and mixing therebetween. Through this relationship between the two layers in direct contact with each other, and as described in the paragraph bridging pages 19 and 20 of Applicants' specification, the pattern ink layer and uncured ionizing radiation-curable resin of the surface protective layer are not completely compatibilized with each other, but are kept in a suspended state, so that the suspended portions gather light to form the low-gloss region. When the surface protective layer is crosslinked and cured while maintaining the suspended state, the suspended state can be fixed, so that the low-gloss region 4 (see Figs. 1-3) is formed in a part of the surface protective layer, over the low-luster pattern ink layer and in the vicinity thereof, and recognized as a concave portion due to optical illusion.

As set forth in the claims of the above-identified application, the pattern ink contains a non-crosslinked urethane resin, having a specific molecular weight and glass transition temperature, and effectively provides the elution, dispersion and mixing as discussed previously, achieving effects of the present invention.

To be emphasized is that the low-luster pattern ink layer acts in combination with the surface protective layer in the present invention, in view of direct contact therebetween, and in view of specified interaction therebetween due to materials of these layers, to provide the low-gloss region achieving the appearance of the presently claimed decorative structure.

Note, in particular, pages 19-24 of Applicants' specification. As described therein, the pattern ink layer 3 (see Fig. 1) serves for generating the difference in gloss of the pattern; and it is suggested that resin components of the ink contained in the pattern ink layer, and uncured ionizing radiation-curable resin, are not completely compatibilized with each other but are kept in a suspended state and located in a portion just above the pattern ink layer, so that the suspended portion scatters light to form the low-gloss region. When the surface protective layer is crosslinked and cured while maintaining the suspended state, such a suspended state is fixed, so that the low-gloss region 4 (see Fig. 1) is partially formed in the surface protective layer, and recognized as a concave portion due to optical illusion.

Moreover, by varying coating amount of the pattern ink layer, the pattern ink layer can have an uneven ink thickness, allowing the extent of the portion visually recognized as a concave portion to be stepwise or continuously changed; and, as a result, the decorative material can exhibit a gradation pattern with a difference in gloss which is changed stepwise, or a continuous pattern with the difference in gloss being changed continuously. See page 24, lines 8-19, of Applicants' specification. Note especially claims 5 and 20, and claims dependent thereon.

According to the present invention, it is important that the pattern ink of the pattern ink layer and the material of the surface protective layer are in direct contact

with each other and interact with each other. Note, for example, page 29, lines 13-19, of Applicants' specification.

Takahashi discloses a synchronously embossed decorative sheet including, inter alia, a pattern layer provided on the substrate, a nonpenetrable layer provided on the pattern layer, in tune with the pattern in the pattern layer, the nonpenetrable layer comprising a coating composition being nonpenetrable by an ionizing radiation curing resin; and a top coat layer provided so as to cover the layers on the substrate and to conform to the shape of concaves and convexes in the pattern layer. See column 2, lines 17-33. Note also column 2, lines 54-66. See, further, column 3, lines 1-3; and column 4, line 67, to column 5, line 3.

In Takahashi, the nonpenetrable layer 5 is formed for preventing penetration of the ionizing radiation curing resin, and is formed by an ink nonpenetrable by an ionizing radiation curing resin constituting the top coat. It is respectfully submitted that disclosure of the nonpenetrable layer 5 and of the top coat in Takahashi would have neither disclosed nor would have suggested, and in fact would have taught away from, the presently claimed decorative material, including, inter alia, wherein the pattern ink of the pattern ink layer has the property of interacting with the ionizing radiation-curable resin composition to cause elution, dispersion and mixing therebetween, quite different from the ink forming the nonpenetrable layer 5 of Takahashi.

Moreover, Takahashi would not have taught or suggested a pattern ink layer, as in the present claims, that includes a non-crosslinked urethane resin of a number average molecular weight of 10,000 to 50,000 and a glass transition temperature of -70° to -40°C.

It is emphasized that in Takahashi, a decorative sheet is obtained by providing a nonpenetrable layer on only a pattern layer, by the use of a nonpenetrable ink, with a top coat 6 provided above the entire surface of the sheet. In this case, the top coat 6 remains on the nonpenetrable layer, of course, without penetration thereof; and in a region where no nonpenetrable layer is provided, the top coat will penetrate into a penetrable layer to cause a physically different level in height to appear, and to form a concavo-convex pattern. That is, the combination of the penetrable and nonpenetrable layers, together with the top coat, causes the physical concavo-convex pattern to appear. Note, for example, column 2, lines 54-67 of Takahashi.

In contrast, according to the present invention, the decorative material sheet is obtained by applying the ionizing radiation-curable resin composition directly on a low-luster pattern ink layer (including a non-crosslinked urethane resin), resin of the pattern ink layer not being completely compatible with resin of the ionizing radiation-curable resin composition providing a surface protective layer, and due to, e.g., the lack of complete compatibility of the low-luster pattern ink layer with the ionizing radiation-curable resin composition a low-gloss region is formed having a mat feeling to obtain a decorative sheet excellent in design property, which has the illusion of a visual concavo-convex pattern.

As can be seen in the foregoing, Takahashi, with different structure including the non-penetrable layer 5 in direct contact with the top coat 6, operates by a different mechanism from the present invention; and it is respectfully submitted that Takahashi would have neither disclosed nor would have suggested the presently claimed structure, including the pattern ink of the pattern ink layer of materials and

having the property relative to the surface protective layer as recited in the present claims, and low-gloss regions and advantages due thereto.

Applicants respectfully traverse the contention by the Examiner that Takahashi discloses, as non-penetrable layer 5, "a low-luster pattern ink layer" as in the present claims, and it is respectfully submitted that this reference does not disclose, nor would have suggested, such low-luster pattern ink layer containing, inter alia, a non-crosslinked urethane resin, having a number average molecular weight and glass transition temperature as in the present claims, or wherein the pattern ink of this layer has the property of interacting with the ionizing radiation-curable resin composition of the surface protective layer to cause elution, dispersion and mixing therebetween, as in all of the claims, in particular, the structure as in claims 30 and 31, emphasizing again that in Takahashi the layer 5 is a non-penetrable layer, as recognized by the Examiner on page 2 of the Office Action mailed December 24, 2009.

Contentions by the Examiner on page 3 of the Office Action mailed December 24, 2009, that in Takahashi there is provided a first low-gloss region located in a portion just above the low-luster pattern ink layer, the Examiner referring to a region just above layer 5 in Takahashi, is respectfully traversed. Again, it is emphasized that according to Takahashi layer 5 is a non-penetrable layer with respect to the top coat, there thus being, for example, no interaction therebetween. It is respectfully submitted that Takahashi does not disclose specifically a low-gloss region as alleged by the Examiner, much less providing structure which achieves the optical illusion as in the present invention.

The contention by the Examiner on page 3 of the Office Action mailed December 24, 2009, that the pattern layer in Takahashi "serves to generate a gloss

difference and elution, dispersion and mixing cause inherently due to the same materials and same structure”, is respectfully traversed. Again, it is emphasized that in Takahashi the layer 5 is expressly and specifically described as a non-penetrable layer with respect to the top coat. Clearly, this express disclosure in Takahashi would have taught away from the elution, dispersion and mixing as in the present invention. While the Examiner contends that same materials and same structure are in Takahashi, as in the present invention, such contention by the Examiner is specifically traversed. Again emphasizing that Takahashi has non-penetrable layer 5, clearly the same materials and the same structure are not achieved in Takahashi, as in the present invention.

Attention is again respectfully directed to present claims reciting a penetration-preventing layer (e.g., claims 15, 17, 26, 27, 34 and 35), between the substrate and the low-luster pattern ink layer, directly opposite to the layer sequence in Takahashi of penetrable layer 4 being beneath non-penetrable layer 5 with top coat 6 on non-penetrable layer 5. Clearly, the structure of Takahashi would have taught away from such feature of the present invention, and advantage thereof.

It is respectfully submitted that the teachings of the additional references as applied by the Examiner in combination with the teachings of Takahashi as the primary reference, would not have rectified the deficiencies of Takahashi, such that the presently claimed invention as a whole would have been obvious to one of ordinary skill in the art.

Morishima, et al. discloses an aqueous emulsion comprising a self-emulsifiable copolymer in which at least one ethylenically unsaturated monomer and at least one urethane prepolymer having at least one mercapto group and at least one hydrophilic, polar group are bonded by radical. See column 3, lines 13-19, for

example. See also column 4, lines 32-40; and column 7, lines 9-62. Note also column 12, lines 49-60, with respect to the molecular weight of the self-emulsifiable copolymer. The Examiner has referred to column 9, lines 25-30, and column 13, lines 1-15, with respect to the molecular weight of the urethane as in the present claims.

Initially, it is emphasized that Morishima, et al. is directed to a self-emulsifiable copolymer. It is respectfully submitted that one of ordinary skill in the art in connection with Takahashi, or facing problems addressed in the present invention, would not have looked to the teachings of Morishima, et al. In other words, Takahashi and Morishima, et al. are directed to non-analogous arts.

Moreover, there would have been no proper reason to combine the teachings of these references other than through hindsight use of Applicants' disclosure, which hindsight use is improper under the requirements of 35 USC 103.

In any event, even if the teachings of Takahashi and Morishima, et al. were properly combinable, such combined teachings would have neither taught nor would have suggested the presently claimed invention, including the interaction of the pattern ink layer and surface protective layer, or use of the non-crosslinked urethane resin having, inter alia, the glass transition temperature as in the present claims, and advantages achieved thereby. Applicants specifically traverse the contention by the Examiner that the glass transition temperature recited in the present claims would be inherent in the self-emulsifiable copolymer of Morishima, et al; the Examiner has provided no evidence or proper reasoning in support of this contention of inherency.

Tsukada, et al. discloses a decorative sheet including a sheet having a transparent plastic first substrate sheet and a pattern-printed layer partially or wholly embedded in one or both of the surfaces of the first substrate sheet, a laminate

sheet being formed by laminating a transparent plastic second substrate sheet on one surface of the above-mentioned sheet, and a sheet formed by laminating a plastic third substrate sheet having a concealing effect on one surface of the above-mentioned sheet or laminate sheet. See column 1, lines 31-42. Note also column 2, lines 3-8. See, further, column 6, lines 53-55.

Even assuming, arguendo, that the teachings of Tsukada, et al. were properly combinable with the teachings of Takahashi and Morishima, et al., such combined teachings would have neither disclosed nor would have suggested the present invention, including, inter alia, the layers in direct contact, or the property of the pattern ink of the pattern ink layer, with respect to the ionizing radiation-curable resin composition, achieving the effect as in the present claims, or other features of the present invention as discussed in the foregoing. Again, it is emphasized that by having the surface protective layer in direct contact with the pattern ink layer, and the layers made of materials as in the present claims, including the recited property of the pattern ink of the pattern ink layer, the low-gloss regions achieve the beneficial visual effect of the present claims. It is respectfully submitted that the combined teachings of references as applied by the Examiner do not disclose, nor would have suggested, such materials with the recited property of the pattern ink and the direct contact, the effect achieved in combination, and advantages thereof; or the specific structure of the low-gloss region as in claims 30-33, and advantages thereof; or other features of the present invention set forth in the dependent claims, and advantages thereof.

Ogawa, et al. discloses an amorphous silica filler, which exhibits excellent handling properties and processability, and which, when added to a resin film, exhibits excellent dispersing properties, transparency and anti-blocking property, the

amorphous silica filler being described, for example, in column 2, lines 33-45. As for properties of the amorphous silica filler, note column 3, lines 54-65, of this patent. See, paragraph bridging columns 3 and 4 of this patent, as well as column 7, lines 17-34.

Even assuming, arguendo, that the teachings of Ogawa, et al. were properly combinable with the teachings of the other references as applied by the Examiner, such combined teachings would have neither disclosed nor would have suggested the presently claimed decorative material, including, inter alia, wherein the surface protective layer and the pattern ink layer are in direct contact with each other, with, e.g., the pattern ink of the pattern ink layer having a property of achieving the specified interaction, providing various advantages achieved by the present invention; and/or structure of the low-gloss region as in claims 30-33, and/or other features of the present invention discussed previously, and advantages thereof.

It is respectfully submitted that the additional teachings of Klun, et al., as applied by the Examiner, even in combination with teachings of the other references as applied by the Examiner, would have neither disclosed nor would have suggested the presently claimed subject matter.

Klun, et al. discloses protective, organic coatings for wood and other substrates, the coatings being formed from radiation-curable thermoplastic coating compositions. The disclosed compositions include normally solid, organic solvent-soluble, thermoplastic, polyethylenically-unsaturated, cellulosic polyurethane polymers as described most generally in column 3, lines 27-61 of this patent. See also the paragraph bridging columns 3 and 4 of this patent.

Even assuming, arguendo, that the teachings of Klun, et al. were properly combinable with the teachings of the other references as applied by the Examiner, it

is respectfully submitted that such combined teachings would have neither disclosed nor would have suggested, and in fact would have taught away from, the presently claimed invention, including the surface protective layer and pattern ink layer being in direct contact with each other, and property of the pattern ink with respect to the surface protective layer, or wherein the pattern ink includes a non-crosslinked urethane resin with molecular weight and glass transition temperature as in the present claims, and low-gloss region, and advantages thereof.

MacQueen discloses a covering having a surface texture, and methods of making the same, in particular, a textured coating including a surface coating characterized by a coating thickness and a plurality of expanded micro-capsules having a diameter, wherein the coating thickness is less than the diameter of the micro-capsules. Note column 2, lines 31-36; see also column 1, lines 33-35; and column 2, lines 10-15 and 37-44.

Even assuming, arguendo, that the teachings of MacQueen were properly combinable with the teachings of the other references as applied by the Examiner, such combined teachings would have neither disclosed nor would have suggested the presently claimed invention, including the surface protective layer in direct contact with the low-luster pattern ink layer; and/or property and material of the low-luster pattern ink forming the low-luster pattern ink layer, and/or the low-gloss region, and effects of the present invention.

It is respectfully submitted that the combination of teachings of references as applied by the Examiner on pages 13-27 of the Office Action mailed December 24, 2009, including the teachings of U.S. Patent No. 6,558,799 to Takeuchi, et al. as primary reference, would have neither disclosed nor would have suggested the presently claimed invention.

Takeuchi, et al. discloses a decorative material for use, for example, in surface material including decorative sheets, the decorative material including a substrate having at least on its surface an active hydrogen-containing polar functional group; and, provided on the substrate, a two-component cured urethane resin layer and a surface resin layer of a crosslinked coating formed from an ionizing radiation curable acrylate resin, the two-component cured urethane resin layer having a structure of at least three layers of a first resin layer, a second resin layer, and a third resin layer provided in that order from the substrate side, the crosslinking density of the second resin layer being lower than that of the first resin layer and that of the third resin layer. See column 2, lines 13-25. Note also column 2, lines 26-31. This patent goes on to disclose that at least one of the at least three layers constituting the two-component cured urethane resin layer may function as a decorative layer. See column 3, lines 48-53. Note also column 4, lines 31-36.

It is emphasized that in Takeuchi, et al., the layer 2C, in contact with the surface resin layer 3, is described as having a relatively high crosslinking density, and is not disclosed as a patterned layer partially (selectively) provided on the substrate. It is respectfully submitted that the teachings of Takeuchi, et al., even in combination with the teachings of Takahashi and Morishima, et al., would have neither taught nor would have suggested the pattern ink layer formed on part of the substrate, in direct contact with the surface protective layer, the pattern ink of the pattern ink layer having the property specified in the present claims, and including a non-crosslinked urethane resin having a number average molecular weight and glass transition temperature as in all of the present claims, and advantages thereof, particularly with such pattern ink layer generating the low-gloss region as in the present claims.

Moreover, it is again emphasized that according to Takeuchi, et al., the third layer 2C in contact with the surface protective layer comprises a two-component cured urethane resin. And according to Takeuchi, et al., the third layer 2C has a higher crosslinking density. In contrast, according to the present invention the pattern ink forming the low-luster pattern ink layer contains, e.g., non-crosslinked urethane resin having a specified molecular weight and glass transition temperature, noting particularly claims 1 and 2. The cured two-component urethane resin in Takeuchi, et al. has a three-dimensionally crosslinked network molecular structure, different from the non-crosslinked urethane resin of various aspects of the present invention, having a linear molecular structure. Moreover, it is again emphasized that according to the present invention the pattern ink has the property of interacting with the ionizing radiation-curable resin composition. As can be seen from the foregoing, the structure according to the present invention is different from, and would not have been obvious over, the teachings of Takeuchi, et al., even in light of the teachings of secondary references as discussed infra.

That is, it is respectfully submitted that the additional teachings of secondary references as applied together with Takeuchi, et al., on pages 13-27 of the Office Action mailed December 24, 2009, would not have rectified the deficiencies of Takeuchi, et al., such that the presently claimed invention as a whole would have been obvious to one of ordinary skill in the art.

Takahashi and Morishima, et al. have been previously discussed.

For the same reasons as given previously, it is respectfully submitted that one of ordinary skill in the art concerned with in Takeuchi, et al. and in Takahashi would not have looked to the teachings of Morishima, et al; that is, Morishima, et al. is

directed to a non-analogous art with respect to that in Takeuchi, et al. and Takahashi, and that of the present invention.

Moreover, emphasizing that Takeuchi, et al. discloses use of highly cross-linked urethane, the teachings of the applied references, including Takeuchi, et al. as primary reference, would have neither taught nor would have suggested the present invention, including the pattern ink layer comprising the non-crosslinked urethane which has the specified properties including glass transition temperature, and including the pattern ink layer being formed on a part of the substrate, in direct contact with the surface protective layer, with the pattern ink layer having the specified property of interacting with the surface protective layer as in the present claims, and other features of the present invention as discussed in the foregoing and advantages thereof.

Even combining the teachings of Takahashi and Morishima, et al., with the teachings of Takeuchi, et al., and even further in view of the teachings of Tsukada, et al., such combined teachings would have neither disclosed nor would have suggested the presently claimed invention, including the pattern ink layer formed on a part of the substrate, in direct contact with the surface protective layer, with the pattern ink having the property of interacting with the ionizing radiation-curable resin composition for forming the surface protective layer to cause the recited elution, dispersion and mixing, the pattern ink including a non-crosslinked urethane resin having a number average molecular weight and glass transition temperature as in the present claims, and with the pattern ink layer serving to generate the difference in gloss in the surface protective layer above the pattern ink layer and above other portions of the substrate; and/or other features of the present invention as in the

dependent claims, including the more specific definition of the low-gloss region, and advantages of the present invention.

The teachings of McQueen, Klun, et al. and Ogawa, et al. have previously been discussed. Even assuming, arguendo, that the teachings of these applied references were properly combinable with the teachings of other applied references including Takeuchi, et al., such combined teachings would have neither taught nor would have suggested features of the present invention as discussed in the foregoing, including (but not limited to) the pattern ink layer formed on a part of the substrate, in direct contact with the surface protective layer, with the pattern ink having the property of interacting with the ionizing radiation-curable resin composition for forming the surface protective layer to cause the recited elution, dispersion and mixing, the pattern ink including a non-crosslinked urethane resin having a number average molecular weight and glass transition temperature as in the present claims, and with the pattern ink layer serving to generate the difference in gloss in the surface protective layer above the pattern ink layer and above other portions of the substrate; and/or other features of the present invention as in the dependent claims, including the more specific definition of the low-gloss region, and advantages of the present invention.

Applicants respectfully traverse the contention by the Examiner that Takahashi has the same materials and same structure as in the present invention. Contrary thereto, it is respectfully submitted that the same materials and same structure are not in Takahashi. It is again emphasized that in Takahashi a non-penetrable layer 5 is described; according to the present invention the pattern ink has the property of, inter alia, mixing with the radiation-curable resin composition of the surface protective layer. Clearly, the structures, as well as materials forming

such structures, are not the same, the present invention providing a mixed low-gloss region while Takahashi discloses no penetration of the top coat into the non-penetrable layer.

Applicants respectfully traverse any contention by the Examiner that Takahashi explicitly teaches all of the layers, and their gloss and concave/convex appearances. As seen from the foregoing, Takahashi provides concaves and convexes by a different mechanism than that of the present invention, Takahashi physically providing concaves and convexes, while the present invention utilizes a different structure which, due to interaction between the surface protective layer and pattern ink layer, provides an optical illusion of concavo/convex appearance. It is respectfully submitted that the Examiner errs in contending that Takahashi teaches all of the layers and their gloss and convex appearances as in the present invention.

On page 2 of the Office Action mailed December 24, 2009, the Examiner acknowledges that layer 5 in Takahashi is a layer not penetrable by the top coat 6. In view thereof, it is respectfully submitted that the Examiner has not provided a basis for concluding interaction in Takahashi between the non-penetrable layer 5 and top coat 6, as recited in the present claims. In this regard, the contention by the Examiner, pointing to Fig. 1E of Takahashi, that prevention layer 2 is provided therein while layer 5 thereof "is equivalent to the lower-luster pattern ink layer", is respectfully traversed. Again emphasizing that Takahashi discloses that the top coat 6 is not penetrable into the layer 5, clearly the disclosure of this patent would have taught away from the pattern ink layer as in the present claims, of a pattern ink having a property of interacting with the ionizing radiation-curable resin composition to cause elution, dispersion and mixing therebetween, with the low-luster pattern ink containing a non-crosslinked urethane resin and an unsaturated polyester resin as a

binder, the non-crosslinked urethane resin having a number average molecular weight in a range of 10,000-50,000 and a glass transition temperature in a range of -70° to -40°C, and advantages achieved thereby as discussed in the foregoing.

The contention by the Examiner that “the exact same results and properties are inherently expected” in Takahashi, “because the exact same material and exact same structure . . . is employed”, is respectfully traversed. Contrary to the contention by the Examiner, it is respectfully submitted that the exact same material and exact same structure are not employed in Takahashi as in the present invention. Clearly, in view of the express teachings of Takahashi of layer 5 being a non-penetrable layer with respect to the top coat, the express teachings of Takahashi establish that the exact same results and properties are not provided in Takahashi, and the exact same materials and structure are not set forth therein.

It must be emphasized that the present claims recite that the pattern ink forming the low-luster pattern ink layer has a property of interacting with the ionizing radiation-curable resin composition (of the surface protective layer) to cause elution, dispersion and mixing therebetween, claim 30 further reciting that the first, low-gloss region includes a mixture of a resin component of the low-luster pattern ink and resin of the ionizing radiation-curable resin composition for forming the surface protective layer; and claim 31 reciting that this first, low-gloss region is a region formed by interaction of resin of the uncured radiation-curable resin composition for the surface protective layer and a resin component of the low-luster pattern ink layer to cause partial elution, dispersion and mixing therebetween. It is respectfully submitted that such feature of the present invention would have neither been disclosed nor would have been suggested by the applied references. Applicants respectfully traverse that such feature of the present invention is “a process limitation”, as contended by

the Examiner, such feature being a property of materials of the presently claimed structure.

In view of the foregoing comments, reconsideration and allowance of all claims pending in the above-identified application are respectfully requested.

To the extent necessary, Applicants hereby petition for an extension of time under 37 CFR 1.136. Kindly charge any shortage of fees due in connection with the filing of this paper, including any extension of time fees, to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Account No. 01-2135 (case 396.46088X00), and please credit any overpayments to such Deposit Account.

Respectfully submitted,

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